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(56) Documents Cited

GB 1355035 A GB 1354301 A GB 0966196 A

(58) Field of Search

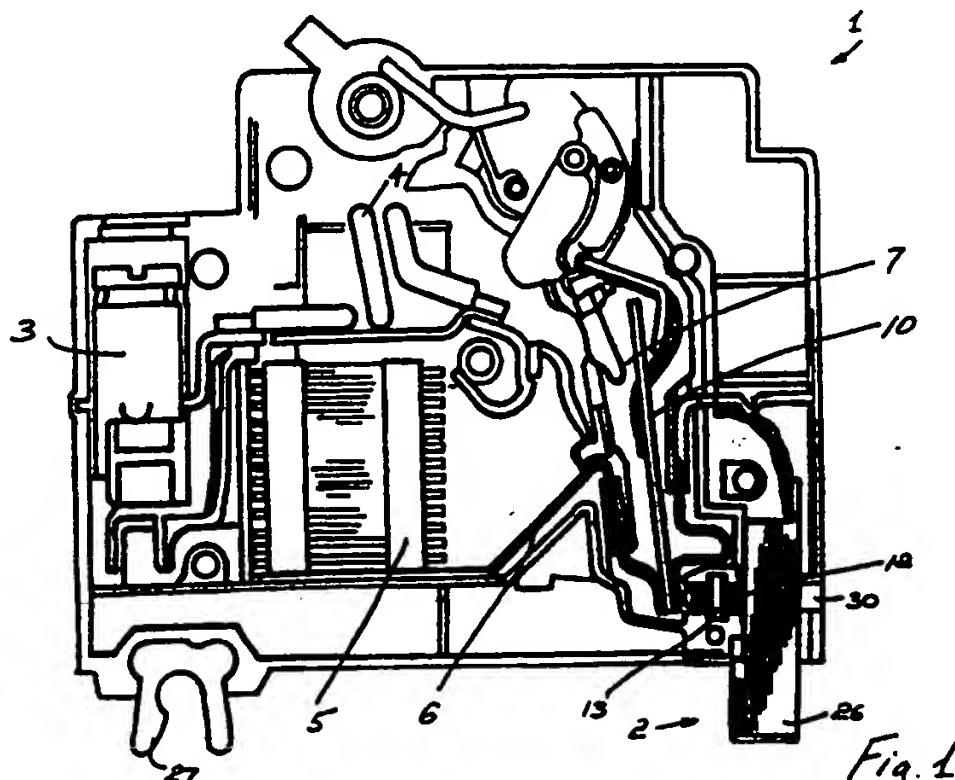
UK CL (Edition M) H1N NCA NCF NCG NCM NCN

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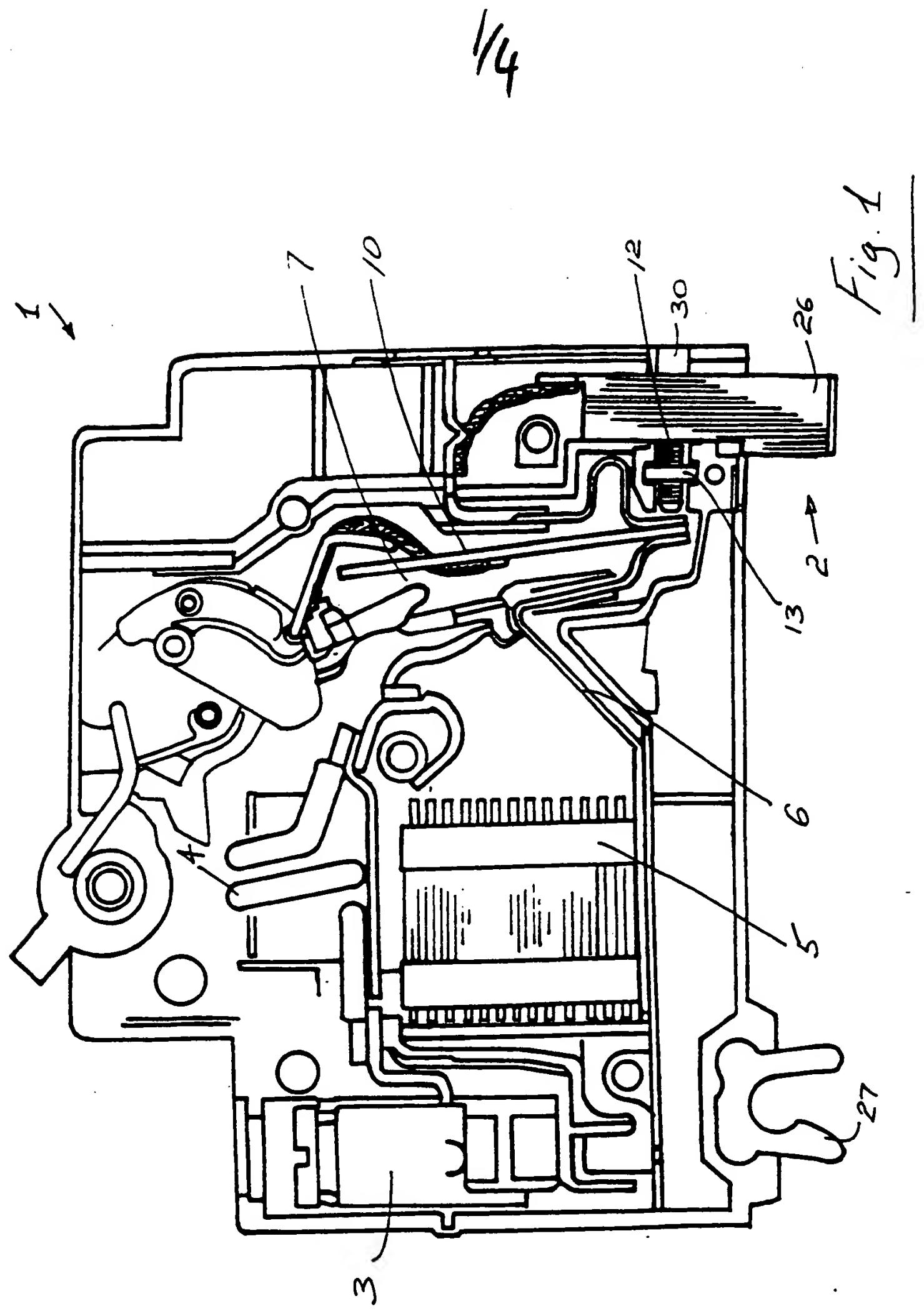
INT CL⁵ H01H

(54) Circuit breaker

(57) A circuit breaker comprises a housing defined by a base and cover, upper and lower rail mounting devices 26, 27 extending from the rear of the housing and an aperture 30 extending through a wall of the housing adjacent to one of the rail mounting devices for providing access to a calibration device 12 within the housing, eg for adjusting a bimetal 10. The aperture 30 may be positioned between a pair of spaced apart jaws defining the upper rail mounting device 26 which ensures that the calibration device 12 can only be operated when the circuit breaker is disconnected from the electrical supply.



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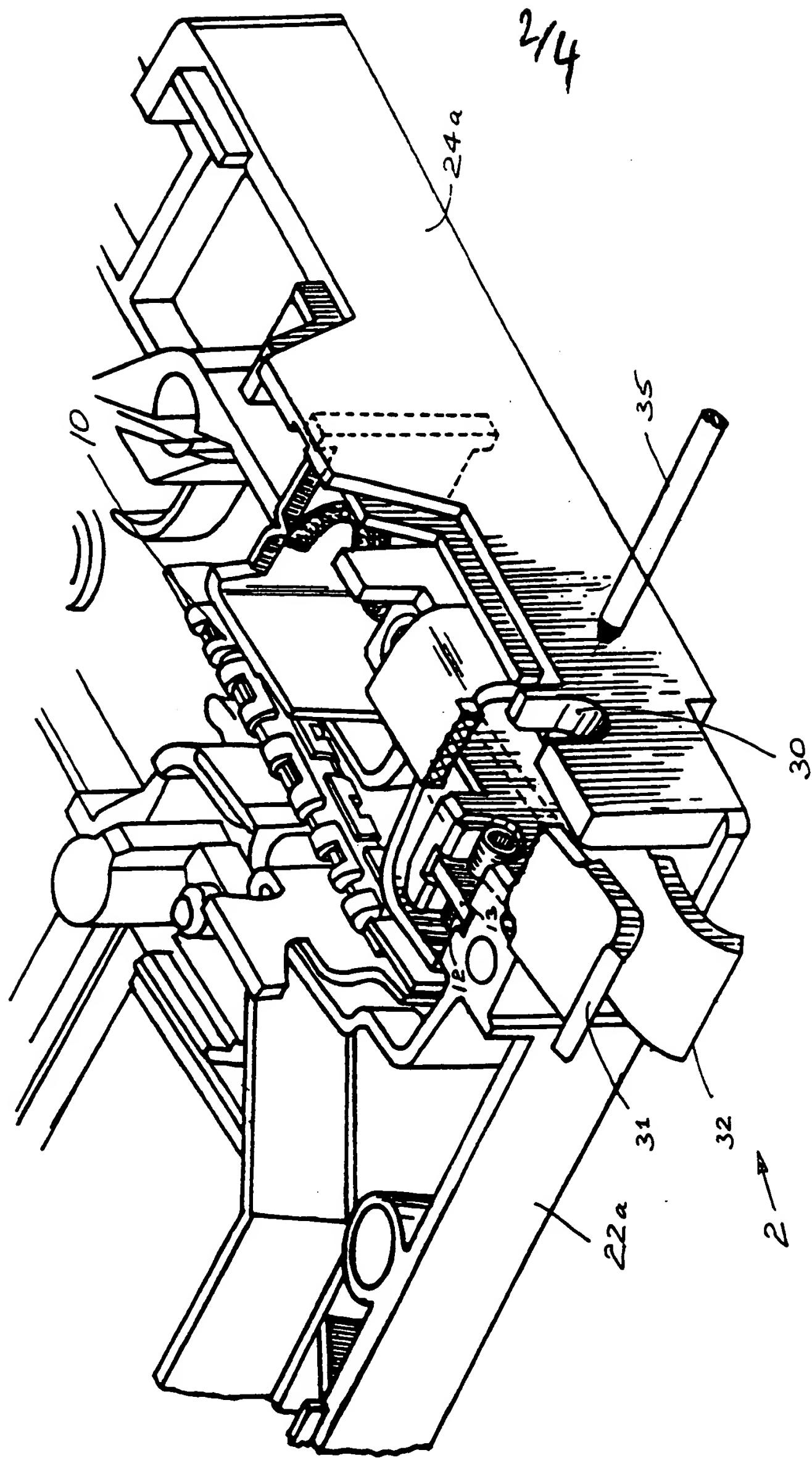


Fig. 2

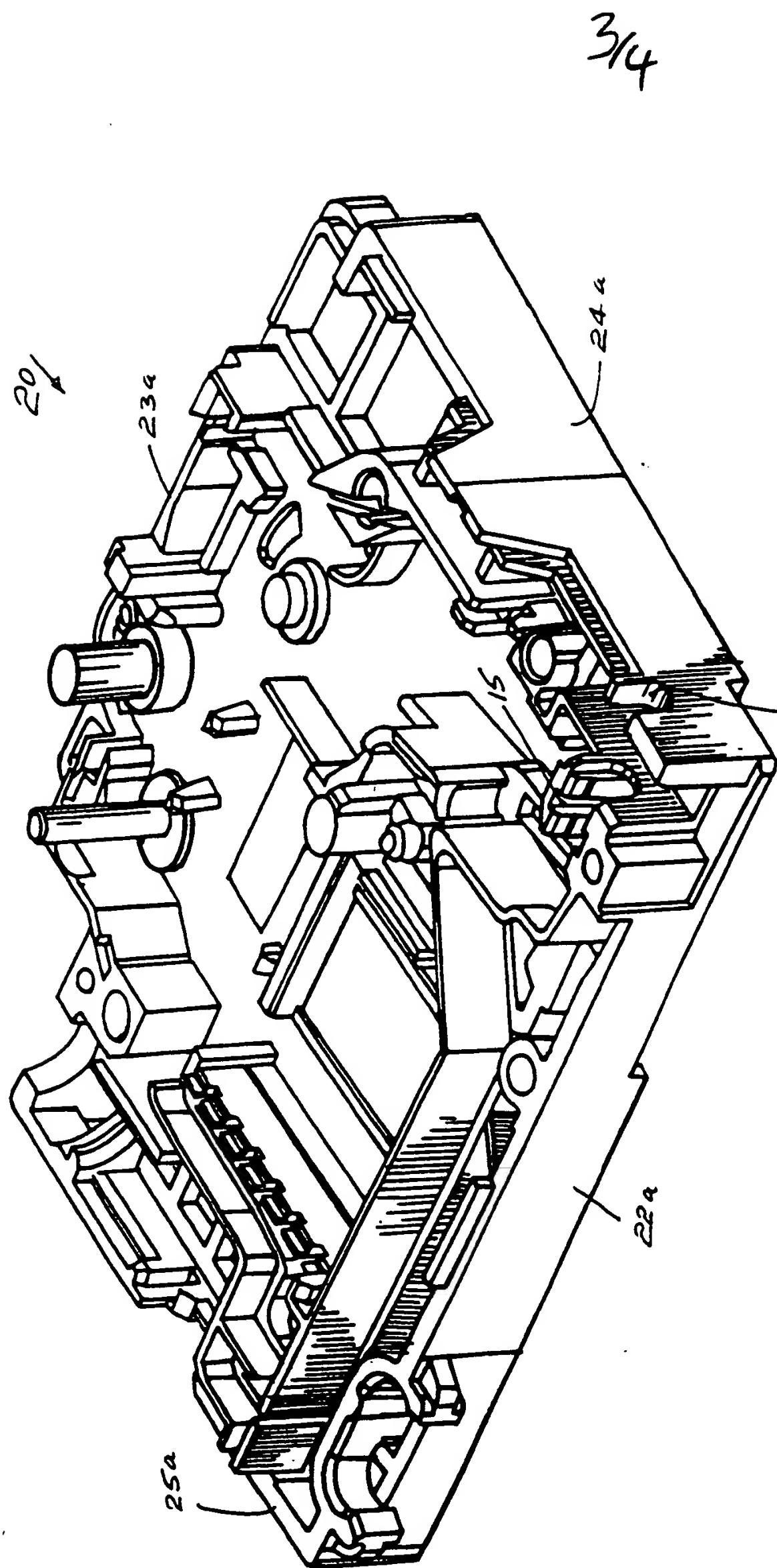
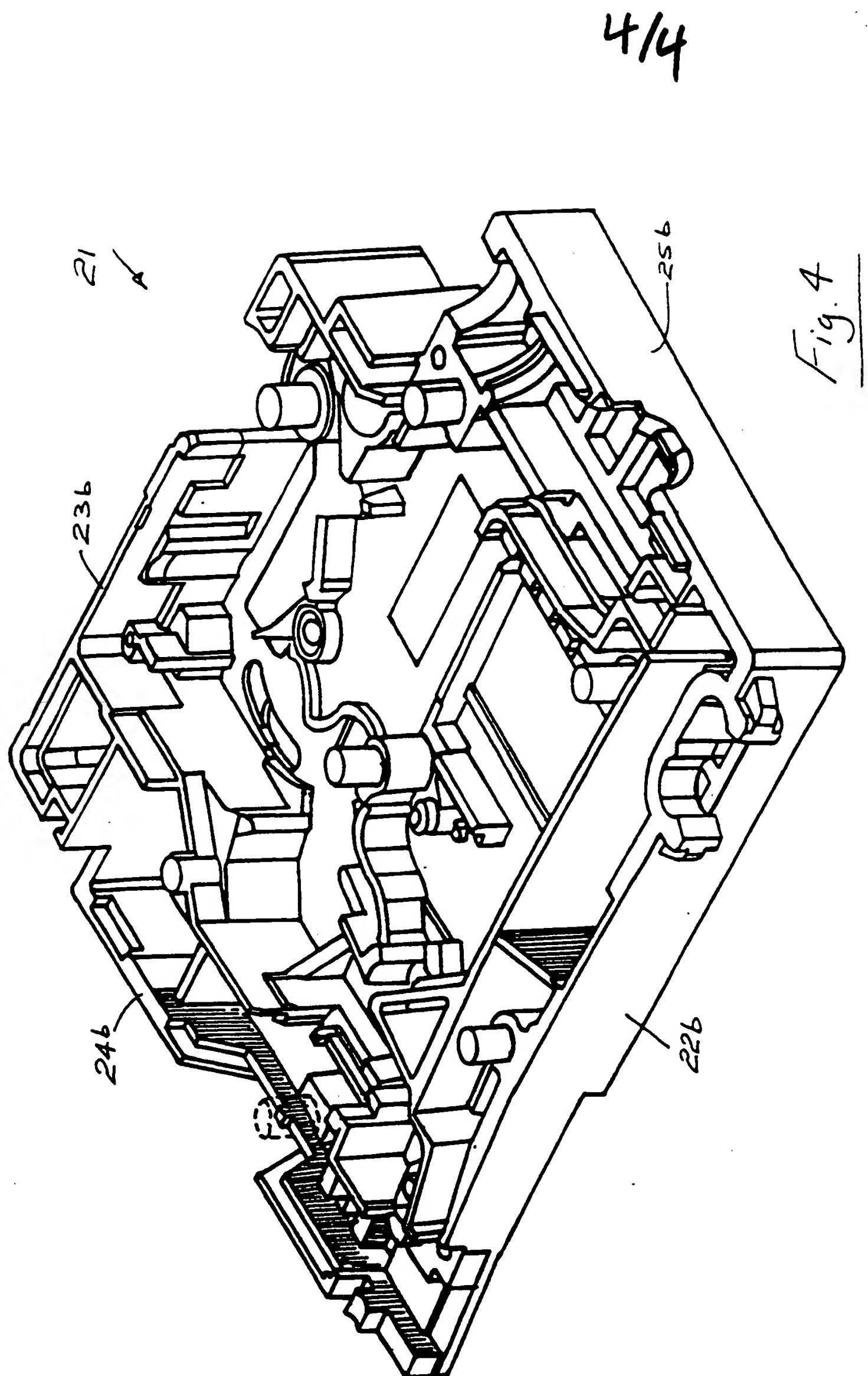


Fig. 3



"A Circuit Breaker"

The invention relates to a circuit breaker.

More particularly, the invention relates to a circuit breaker of the type comprising a base and a cover, the base and/or cover having a rear wall portion, a front wall portion and a pair of side wall portions extending between the front and rear wall portions to define an enclosure, upper and lower rail mounting devices extending from the rear wall of the housing, an aperture extending through a wall of the housing through which access is gained to a calibration device in the enclosure.

Circuit breakers of this type are known. In conventional circuit breakers however the aperture through which access is gained to the calibration device in the enclosure is generally located in a position such that the calibration can be relatively easily tampered with even in some cases while the breaker is in use. In some cases the calibration aperture is covered by a separate cover, however, this is not entirely satisfactory as the cover may also be removed.

There is therefore a need for an improved circuit breaker which will overcome this difficulty.

This invention is characterised in that the aperture through which access is gained to a calibration device in the housing extends through a wall of the housing adjacent to the upper or lower rail mounting devices.

The advantage of this arrangement is in locating the access to the calibration device in an inaccessible position so that the calibration cannot be easily tampered with and more particularly cannot be tampered with while the circuit breaker is in use. This removes the need to have a cover over the calibration device.

In one embodiment of the invention the aperture extends through a wall of the housing adjacent to the upper rail mounting device. The advantage of this arrangement is that the upper rail mounting device is usually a line terminal for coupling to a source of electricity and the calibration cannot be tampered with without uncoupling the circuit breaker from the source of electricity.

In one arrangement, the upper rail mounting device comprises a pair of spaced-apart jaws extending from the rear wall of the housing and the aperture extends through the housing between the jaws.

In a preferred embodiment of the invention, the aperture extends through a side wall of the housing.

In one embodiment of the invention the circuit breaker includes a bimetallic element mounted in the enclosure and the calibration device comprises a calibration screw engaging the bimetallic tripping element.

In a preferred embodiment of the invention the calibration screw is rotatably mounted in a nut which is an interference fit in a slot in the base of the circuit breaker housing.

The invention will be more clearly understood from the following description thereof given by way of example only with reference to the accompanying drawings in which :-

Fig. 1 is a view of a circuit breaker according to the invention with a cover removed;

Fig. 2 is a perspective view of a detail of the circuit breaker of Fig. 1;

5 Fig. 3 is a perspective view of a base part of the circuit breaker; and

Fig. 4 is a perspective view of a cover part of the circuit breaker.

10 Referring to the drawings, there is illustrated a circuit breaker 1 including a line terminal 2 for coupling to a source of electricity and a load terminal 3 for coupling to a load. The current path includes a coil 4 and an arc runner 6. An arc stack 5 assists in breaking any arc formed when contacts 7 are separated under load. The 15 contacts 7 may be separated in response to operation of a bimetal 10. The bimetal 10 is adjusted by means of a calibration screw 12. The coil 4 causes separation of the contacts 7 in the event of a current surge.

20 The circuit breaker 1 comprises a base 20 and a cover 21. The base 20 and cover 21 both have rear wall portions 22a, 22 respectively, front wall portions 23a, 23b, upper sidewall portions 24a, 24b and lower sidewall portions 25a, 25b respectively which cooperate on assembly of the base 20 and cover 21 to form an enclosure for the various 25 components of the circuit breaker 1.

Upper and lower rail mounting devices 26, 27 extend from the rear of the housing. The rail mounting device 26 is defined by the line terminal 2 which includes a pair of spaced-apart jaws 31, 32.

An aperture 30 is provided in the upper sidewall portion 24a adjacent to the upper mounting element defined by the line terminal 2 for access to the calibration screw 12 by a calibration device 35, portion of which is illustrated 5 in Fig. 2.

It will be noted that the aperture 30 is positioned so that the calibration device 35 must pass through the jaws 31,32 of the line terminal 2 to engage the calibration screw 12. This is particularly advantageous as it ensures 10 that the calibration screw 12 can only be operated when the line terminal 2 is disconnected from the electrical supply, i.e. when the breaker is not in use. A standard calibration screw 12 may be used. Typically the screw is contained within a nut 13 which is captive in a slot 15 in 15 the base 20 of the enclosure. The locking of the screw 12 is achieved by an interference fit between the screw and the enclosure surface in the area of the nut 13.

The primary advantage of the invention is in providing necessary access to the calibration screw for calibrating 20 the bimetal while ensuring that the circuit breaker must be disconnected from the supply for calibration.

Many variations on the specific embodiment of the invention will be readily apparent and accordingly, the invention is not limited to the embodiment hereinbefore 25 described which may be varied in both construction and detail.

CLAIMS

1. A circuit breaker comprising a housing defined by a base and a cover, the base and/or cover having a rear wall portion, a front wall portion and a pair of side wall portions extending between the front and rear wall portions to define an enclosure, upper and lower rail mounting devices extending from the rear of the housing, an aperture extending through a wall of the enclosure through which access is gained to a calibration device in the enclosure;
5 characterised in that the aperture extends through a wall portion of the housing adjacent to the upper or lower rail mounting devices.
- 10
- 15 2. A circuit breaker as claimed in claim 1 wherein the aperture extends through a wall portion of the housing adjacent to the upper rail mounting device.
- 20 3. A circuit breaker as claimed in claim 2 wherein the upper rail mounting device comprises a pair of spaced-apart jaws extending from the rear wall of the housing and the aperture extends through the housing between the jaws.
- 25 4. A circuit breaker as claimed in claim 3 wherein the aperture extends through a side wall of the housing.
5. A circuit breaker as claimed in any preceding claim wherein the circuit breaker includes a bimetallic element mounted in the enclosure and the

calibration device comprises a calibration screw with
engaging the bimetallic element.

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6. A circuit breaker as claimed in any preceding claim wherein the calibration screw is rotatably mounted in a nut which is an interference fit in a slot in the base of the circuit breaker housing.
7. A circuit breaker substantially as hereinbefore described with reference to the accompanying drawings.

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Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Relevant Technical Fields

(i) UK Cl (Ed.M) H1N (NCA, NCF, NCG, NCM, NCN, NCT, NCX, NCZA)

(ii) Int Cl (Ed.5) H01H

Search Examiner
Mr P Corbett

Date of completion of Search
2 December 1994

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-
1 to 7

Categories of documents

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|----|---|----|---|
| X: | Document indicating lack of novelty or of inventive step. | P: | Document published on or after the declared priority date but before the filing date of the present application. |
| Y: | Document indicating lack of inventive step if combined with one or more other documents of the same category. | E: | Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| A: | Document indicating technological background and/or state of the art. | &: | Member of the same patent family; corresponding document. |

| Category | Identity of document and relevant passages | | Relevant to claim(s) |
|----------|--|------------------------------|----------------------|
| X | GB 1355035 | (WILCOX) see Figure 1 | 1,2 |
| X | GB 1354301 | (THE RUCKER CO) see Figure 2 | 1,2 |
| X | GB 0966196 | (SQUARE D) see Figure 2 | 1,2,5 |

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).